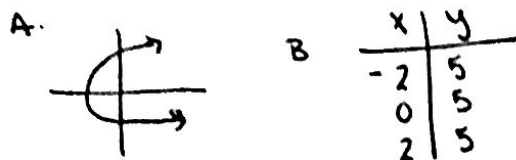


Idea 1 - Is it a Function?

100 - Is it a function



200 - I have a set of pairs $\{(3, 7), (-1, 4), (5, 3)\}$.

Write a point that, when added to the set, makes the set NOT be a function.

Idea 2 - Evaluating Functions

100 - $f(x) = 10x - 4$. Find $f(2)$

200 - $g(x) = 2x^2 + 5x - 6$. Find $f(-3)$

300 - $h(x) = \frac{x^2 + 7x - 4}{x - 3}$. Find $h(-1)$

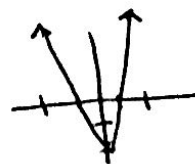
400 - If $f(x) = 3x + 7$, Find $2f(x) + 1$

500 - Based on the graph. Find $f(5)$

Idea 3 - Domain + Range

100 - $(-\infty, \infty)$ or \mathbb{R} is called "_____"

200 - Give the domain + range of



300 - Which function has a range of all real numbers?

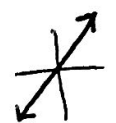
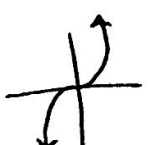
A. $f(x) = x^4$ B. $f(x) = x^5$ C. $f(x) = e^x$

400 - A school has a student teacher ratio of 32:1, given in the function $f(x) = 32x$, where x is # teachers and $f(x)$ is # students. Give a number that cannot be in the domain

Idea 4 - Transformations

- 100 - Describe the transformation in $f(x) = (x+2)^2 - 1$
- 200 - Describe the transformations in $f(x) = -5 \ln x + 3$
- 300 - Describe the transformations in $f(x) = -2 \sin(3x)$

Idea 5 - Function Families

- 100 - Give the name that matches the graph shape 
- 200 - Give the equation for the exponential parent function
- 300 - Give the name and equation to match 

Idea 6 - Combining

- 100 - $f(x) = 3x + 5$ $g(x) = x^2 + 7$. Find $(\frac{g}{f})(x)$
- 100 - $f(x) = 12x - 5$ $g(x) = x^2 + 3x - 1$. Find $(f+g)(x)$
- 200 - $f(x) = 8x$ $g(x) = 3x^2 - 5x + 2$. Find $(f \cdot g)(x)$
- 300 - $f(x) = x^2 + 10x$ $g(x) = 4x^2 - 6x + 3$. Find $(f-g)(x)$
- 400 - The revenue, $R(x)$, from selling a product is $R(x) = 30x$. while the total cost, $C(x)$, of making x units of the product is $C(x) = 12x + 100$.
The total profit, $P(x)$, is given by $P(x) = R(x) - C(x)$
For the values of $R(x)$ and $C(x)$ given above,
what is $P(x)$?

Idea 7 - Composition

100 - $f(x) = 3x$ $g(x) = x + 4$. Find $f[g(x)]$

200 - $f(x) = 2x - 5$ $g(x) = 3x - 1$. Find $g[f(x)]$

300 - $f(x) = 10x + 4$ $g(x) = x^2 - 1$. Find $f[g(-2)]$

400 - $f(x) = x + 2$ $g(x) = x^2 - 3x + 1$. Find $g[f(x)]$

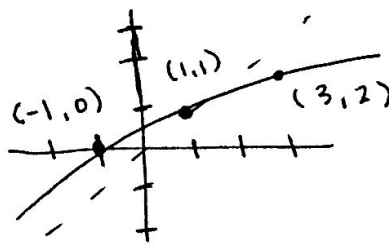
Idea 8 - Inverse

100 - Give the inverse of $\{(2, 1), (7, -4), (3, -5)\}$

200 - Find the inverse of $f(x) = -3x + 1$

300 - Find the inverse of $g(x) = \frac{2}{5}x - 3$

400 - Graph the inverse of



Idea 1

ANSWERS

100 A. NO B. yes

200 (3, any #) or (-1,) or (5,)

Idea 2

100 $f(2) = 10(2) - 4 = 20 - 4 = 16$

200 $g(-3) = 2(-3)^2 + 5(-3) - 6$
 $= 18 - 15 - 6 = -3$

300 $h(-1) = \frac{(-1)^2 + 7(-1) - 4}{-1 - 3} = \frac{1 - 7 - 4}{-4} = \frac{-10}{-4} = \frac{5}{2} = 2.5$

400 $2(3x + 7) + 1 = 6x + 14 + 1 = 6x + 15$

500

10



Idea 3

100 All real numbers

200 D: \mathbb{R} R: $[-2, \infty)$

300) $f(x) = x^5$ (Any odd powered function)

400 Any negative # or 0

Idea 4

ANSWERS

100 $(x+2)^2 - 1$
 $c = -2$ shift left $d = -1$ shift down

200 $-5 \ln x + 3$ $d = 3$ shift up
 $a = -5$ reflect over x-axis vertical stretch

300 $-2 \sin(3x)$ $b = 3$
 $a = -2$ reflect over x-axis vertical stretch horizontal shrink

Idea 5

100 - Linear

200 - $f(x) = e^x$

300 - Cubic, $f(x) = x^3$

Idea 6

100 - $\frac{x^2 + 7}{3x + 5}$

100 $12x - 5 + x^2 + 3x - 1 = x^2 + 15x - 6$

200 $8x(3x^2 - 5x + 2) = 24x^3 - 40x^2 + 16x$

300 $x^2 + 10x - (4x^2 - 6x + 3)$
 $x^2 + 10x - 4x^2 + 6x - 3 = -3x^2 + 16x - 3$

400 $P(x) = R(x) - C(x)$
 $= 30x - (12x + 100)$
 $= 30x - 12x - 100$
 $= 18x - 100$

Idea 7

ANSWERS

100 $f[g(x)] = 3(x+4) = 3x+12$

200 $g[f(x)] = 3(2x-5) - 1 = 6x - 15 - 1 = 6x - 16$

300 $f[g(-2)]$

$$g(-2) = (-2)^2 - 1 = 4 - 1 = 3$$

$$f(3) = 10(3) + 4 = 30 + 4 = \boxed{34}$$

400 $g[f(x)] = (x+2)^2 - 3(x+2) + 1$

$$= (x+2)(x+2) - 3x - 6 + 1$$

$$= (x^2 + 4x + 4) - 3x - 6 + 1$$

$$= x^2 + x + 1$$

Idea 8

100 $\{(1, 2), (-4, 7), (-5, 3)\}$

200 $y = -3x + 1$
 $x = -3y + 1$

$$\frac{x-1}{-3} = \frac{-3y}{-3}$$

$$f^{-1}(x) = \frac{x-1}{-3} = -\frac{1}{3}x + \frac{1}{3}$$

300 $y = \frac{2}{5}x - 3$

$$x = \frac{2}{5}y + 3$$

$$x + 3 = \frac{2}{5}y$$

$$\frac{5(x+3)}{2} = \frac{2y}{2}$$

$$g^{-1}(x) = \frac{5x+15}{2} = \frac{5}{2}x + \frac{15}{2}$$

400

